

*By  
Conrad*

a movable member arranged to relatively move a mask with respect to said slit area during scanning exposure on a substrate with said illumination beam through said mask, and hold said mask at a position on or near said predetermined plane.

85. (Amended) An apparatus according to claim 84, wherein said optical device forms different intensity distributions of said illumination beam on said pupil plane of said illumination optical system.

### REMARKS

Claims 1-104 are pending. By this Amendment, claims 77, 80 and 83-85 are amended. No new matter is added by the above amendments.

#### **I. DESCRIPTION OF CLAIM AMENDMENTS**

Claims 77, 80 and 83 have been rewritten in independent form, respectively incorporating the features of claims 76, 78 and 81 into those claims. In addition, the word "substrate" from the previous independent claims from which claims 77, 80 and 83 depended, has been changed to "work piece" in claims 77, 80 and 83. The latter half of the first clause of claim 84 has been changed from "...and an optical device substantially arranged on a pupil plane of said illumination optical system between said predetermined plane and said internal reflection type integrator,..." to --...and an optical device which changes an intensity distribution of an illumination beam on a pupil plane of said illumination optical system,....-. In addition, "an illumination beam" has been changed to --said illumination beam-- at the end of that claim 84 clause. Claim 85 has been amended to change "...wherein said optical device changes an intensity distribution of ..." to --...wherein said optical device forms different intensity distributions of ...--.

#### **II. INFORMATION DISCLOSURE STATEMENT**

The Examiner is requested to consider JP-A-6-45221 and the attached translations of paragraphs 4, 5, 12 and 24 of that reference, which are submitted with the attached Information Disclosure Statement.

### **III. SUPPLEMENTAL REISSUE DECLARATION**

A Supplemental Reissue Declaration will be filed shortly that addresses the amendments made to the claims in this Amendment, as well as the alleged informalities of the original Declaration that are identified in the Office Action.

Claims 1-104 stand rejected under 35 U.S.C. §251 due to the allegedly defective reissue Declaration. A Supplemental Reissue Declaration will be submitted shortly in order to overcome this rejection.

### **IV. THE CLAIMS SATISFY 35 U.S.C. §112, SECOND PARAGRAPH**

Claims 77, 80 and 83 stand rejected under 35 U.S.C. §112, second paragraph.

Applicants submit that the above amendments to claims 77, 80 and 83 overcome this rejection.

### **V. THE CLAIMS ARE PATENTABLE OVER THE APPLIED REFERENCES**

Claims 54-57, 64-68 and 76-83 stand rejected under 35 U.S.C. §103(a) over U.S. Patent No. 5,194,893 to Nishi in view of U.S. Patent No. 4,497,015 to Konno et al. or U.S. Patent No. 5,296,892 to Mori or U.S. Patent No. 4,619,508 to Shibuya. These rejections are respectfully traversed.

Nishi discloses a fly-eye lens 7 that forms a plurality of secondary light sources. Illumination light from the plurality of secondary light sources enters into a lens system (a condenser lens) 9 through a beam splitter 8, whereby an intensity distribution of the illumination light is made uniform on a position of a blind mechanism 10. Nishi, however, does not disclose any structure defining an illumination area on a mask or a sectional shape of the fly-eye lens or its elements.

Konno et al. discloses a fly-eye lens structure formed by bundling element lenses, each of which is formed by providing convex lenses on both ends of glass members having a square pole shape or a hexagonal pole shape. Konno et al. does not disclose any structure illuminating a rectangular area on a predetermined plane with an illumination beam while relatively moving a

mask with respect to the rectangular area. Further, Konno et al. does not disclose any relationship between a sectional shape of the element lenses with respect to a rectangular area that is illuminated.

Mori also merely discloses a fly-eye lens, and does not disclose any structure that illuminates a rectangular area on a predetermined plane with an illumination beam while relatively moving a mask with respect to the rectangular area. Mori also does not disclose any relationship between the illumination area and a sectional shape of the elements of the fly-eye lens.

Shibuya et al. discloses a fly-eye lens, but does not disclose any structure that illuminates a rectangular area on a predetermined plane with an illumination beam while relatively moving a mask with respect to the rectangular area. Similarly, Shibuya et al. does not disclose any structure defining the rectangular area or a relationship between a sectional shape of the fly-eye lens elements and a rectangular area.

Accordingly, even if Nishi is combined with Konno et al., Mori or Shibuya et al., that combination does not disclose or suggest providing an internal reflection type integrator wherein "an exit plane of said internal reflection type integrator having a shape substantially equal to a shape of said rectangular area" as recited in independent claim 76. Furthermore, the proposed combinations of references also do not disclose or suggest a fly-eye lens type integrator having a plurality of optical elements each of which has a cross-sectional shape that is substantially the same as that of a slit area on a predetermined plane illuminated with the illumination beam as recited in independent claims 54 and 78. Furthermore, the proposed combinations of references also does not disclose or suggest making the number of light sources arranged in a first direction corresponding to a longitudinal direction of a slit area different from the number of light sources arranged in a second direction crossing the first direction as recited in independent claims 64 and 81.

Accordingly, Applicants respectfully submit that the rejections of claims 54-57, 64-68 and 76-83 should be withdrawn.

Claims 43-48 and 84 stand rejected under 35 U.S.C. §103(a) over Nishi in view of U.S. Patent No. 5,719,704 to Shiraishi et al. or U.S. Patent No. 4,918,583 to Kudo et al. These rejections are respectfully traversed.

Shiraishi et al. discloses a rod type integrator having a rectangular pole shape. Shiraishi et al. does not disclose any structure illuminating a rectangular area on a predetermined plane with an illumination beam while relatively moving a mask with respect to the rectangular area. Shiraishi et al. also does not disclose or suggest any relationship between the sectional shape of the rod type integrator and the rectangular area (since Shiraishi et al. does not disclose illuminating a rectangular area).

Kudo et al. also discloses a rod type integrator, but does not disclose or suggest any structure illuminating a rectangular area on a predetermined plane with an illumination beam while relatively moving a mask with respect to the rectangular area. Thus, Kudo et al. also does not disclose or suggest any relationship between the sectional shape of the rod type integrator and the rectangular area (since Kudo et al. does not disclose illuminating a rectangular area).

Accordingly, even if Nishi is combined with Shiraishi et al. or Kudo et al., the proposed combinations do not disclose or suggest providing an internal reflection type integrator having an exit plane with a shape substantially the same as that of the rectangular area on the predetermined plane illuminated with the illumination beam as recited in independent claim 43. The combinations of references also do not disclose or suggest an illumination optical system having an internal reflection type integrator on an optical axis of the illumination optical system and an optical device that changes an intensity distribution of an illumination beam on a pupil plane of the illumination optical system as recited in independent claim 84.

Accordingly, the rejections of claims 43-48 and 84 should be withdrawn.

**VI. CONCLUSION**

In view of the foregoing, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further would be desirable to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,



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JAO:MAC/ccs

**Attachments:**

Petition for Extension of Time  
Amendment Transmittal  
Information Disclosure Statement

Date: October 11, 2001

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